

**GROUNDWATER  
MONITORING WORKPLAN  
2002**

**BOEING REALTY CORPORATION  
FORMER C-6 FACILITY,  
LOS ANGELES, CALIFORNIA**

Prepared for:  
Boeing Realty Corporation  
3760 Kilroy Airport Way, Suite 500  
Long Beach, California 90806

**DECEMBER 20, 2001**

**HALEY &  
ALDRICH**

**BOE-C6-0049082**

**GROUNDWATER MONITORING WORK PLAN 2002  
FORMER C-6 FACILITY  
LOS ANGELES, CALIFORNIA**

by

**Haley & Aldrich, Inc.  
San Diego, California**

for

**Boeing Realty Corporation  
Long Beach, California**

**File No. 27608-010  
December 2001**

## **GROUNDWATER MONITORING WORKPLAN 2002**

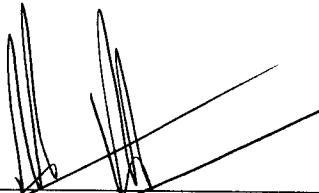
**BOEING REALTY CORPORATION  
FORMER C-6 FACILITY  
LOS ANGELES, CALIFORNIA**

Prepared for

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## **1.0 INTRODUCTION**

This work plan has been prepared for continuing groundwater monitoring at Boeing Realty Corporation's (BRC) Former C-6 Facility (Site) in Los Angeles, California (Figure 1). A total of 37 groundwater monitoring events have been performed since 1987. Two monitoring events are planned for 2002: a Site-wide annual event in March and a source-area specific event in September. This workplan proposes the groundwater monitoring wells that will be sampled and chemicals that will be analyzed during each event. The following sections of this workplan present a Site background, the proposed groundwater monitoring program, and reporting.

### **1.1 Background**

#### **1.1.1 Site Geology**

Groundwater monitoring wells and soil borings drilled at the Site have encountered the Lakewood Formation. The Lakewood Formation consists of two major Hydrostratigraphic Units; the Bellflower Aquitard and the Gage Aquifer. Groundwater monitoring wells at the Site have only been installed within the Bellflower Aquitard Unit, which extends to a depth of approximately 140 feet below ground surface (bgs). The top 20 to 50 feet of the Bellflower Aquitard below the Site consists of fine-grained soils (predominantly fine sands, silts, and clays) that become thicker to the east. A sandy zone that dips downward to the east underlies the fine-grained soils. The sandy zone is generally 80 to 100 feet thick and contains discontinuous layers of fine-grained sediment that also dip down to the east. Although the fine-grained layers within the sandy unit are discontinuous, there are two separate fine-grained layers that are relatively continuous. Beneath some areas of the Site, the discontinuous fine-grained units overlap. The sandy unit is underlain by another fine-grained zone at approximately 110 to 140 feet bgs.

#### **1.1.2 Site Hydrogeology**

Groundwater conditions at the Site are reasonably understood from previous investigations and groundwater monitoring events (Kennedy/Jenks Consultants, 2000a and Haley & Aldrich, Inc./England Geosystem, 2001). Groundwater at the Site is located in sediments of the Bellflower Aquitard, which has two sub-units, the Middle Bellflower Aquitard and the Lower Bellflower Aquitard. The uppermost groundwater appears to be under water table conditions at depths of 60 to 70 feet bgs. Most of the Site groundwater monitoring wells are completed near the water table at depths of 55 to 90 feet bgs. Two deeper wells, WCC-1D and WCC-3D, were completed in a deeper zone at about 115 to 140 feet bgs. Well WCC-1D has since been abandoned.

Groundwater flow at the Site is predominately to the south under a gradient of approximately 0.001 ft./ft. The following sections briefly discuss the Site-specific water-bearing units of the Middle Bellflower Aquitard (Poland and others, 1959 and Department of Water Resources [DWR], 1961).

## 1. Middle Bellflower Aquitard

The Middle Bellflower Aquitard is a massive, light yellowish brown, fine to medium sand with local muddy zones. An extensive mud layer referred to as the Middle Bellflower mud (MBFM) locally interrupts this sand. Where divided, the top sand subunits are referred to as the B-Sand (MBFB) and the bottom sand subunits are referred to as the C-Sand (MBFC). The MBFM is discontinuous across the area and is comprised of laminated silts and layered silts and very fine sands.

### a. *B-Sand (MBFB)*

The B-Sand is found at an approximate depth of 30 feet bgs at the Site and is generally from 25 to 60 feet thick. The B-Sand is found at different depths across the Site ranging from an approximate minimum depth of 30 feet bgs to an approximate maximum depth of 90 feet bgs. The B-Sand predominantly consists of interbedded fine sands and silts. Groundwater flow within the B-Sand is predominantly to the south.

The uppermost groundwater at the Site occurs with in the B-Sand at depths of 60 to 70 feet bgs. Most of the groundwater monitoring wells at the Site are completed within the B-Sand. Table 1 includes groundwater monitoring well completion information.

### b. *C-Sand (MBFC)*

The C-Sand is found at an approximate depth of 75 to 90 feet bgs at the Site and extends to a depth of up to approximately 125 feet bgs. The C-Sand predominantly consists of interbedded medium to fine sands. Groundwater flow within the C-Sand is believed to be to the southeast (Kennedy Jenks Consultants, 2000a). Only one well (WCC-3D) is completed within the C-Sand at the Site.

## 2. Lower Bellflower Aquitard (LBF)

The fine-grained Lower Bellflower Aquitard (LBF) appears to be continuous across the area. It occurs at an approximate depth of 110 to 125 feet bgs and ranges in thickness from 10 to 25 feet. The LBF separates the Bellflower sands from the underlying Gage Aquifer. The Gage Aquifer in the Site vicinity is predominantly sand and ranges in thickness from 40 to 78 feet thick. No groundwater monitoring wells have been drilled into the LBF or Gage Aquifer at the Site.

## **1.2 Historical Groundwater Monitoring Events**

Groundwater information at the Site (Figure 2) comes from three primary sources:

- Groundwater monitoring wells installed at the Site by BRC and its predecessors (prefixes include WCC and TMW);
- Groundwater monitoring wells installed on the Site by International Light Metals (ILM) for investigations at ILM (prefixes DAC and BL); and
- Groundwater monitoring wells installed on the Site by Montrose Chemical Corporation (Montrose) for investigations at Montrose (prefix XMW).

Groundwater investigations started in early 1987 with the installation of one groundwater monitoring well. A total of 43 groundwater monitoring wells have been installed at the Site for groundwater investigations since 1987. Ten of these groundwater monitoring wells have been abandoned as a result of redevelopment activities. Montrose drilled five additional groundwater monitoring wells on the Site, two of which have been abandoned. Groundwater monitoring wells known or assumed to currently exist on the Site are shown on Figure 2. There are a total of 33 groundwater monitoring wells that are currently on site.

Approximately 37 groundwater monitoring events have taken place at the Site. Typically, all of the groundwater monitoring wells were sampled during each groundwater monitoring event, which was performed quarterly until 1997. In 2000, the groundwater monitoring program was modified to consist of two events per year (Kennedy Jenks Consultants, 2000b).

The most recent groundwater monitoring data were collected in July 2001 and the associated report (Haley & Aldrich, Inc./England Geosystem, 2001) describes a typical monitoring event for the Site:

- Thirty-two project groundwater monitoring wells were gauged, purged and sampled.
- Water samples were analyzed for Volatile Organic Compounds (VOCs) by EPA Method 8260B, Title 22 Metals by EPA Method 6010 and Chromium VI by EPA Method 7196.
- Quality Assurance/Quality Control samples (duplicate samples, trip blanks, and equipment blanks [one per day]) were collected and analyzed.

The following sections present the proposed 2002 groundwater monitoring program.

## **2.0 PROPOSED GROUNDWATER MONITORING PROGRAM**

The proposed 2002 groundwater monitoring program consists of two sampling events:

- Annual monitoring (March 2002) and
- Semiannual monitoring (September 2002).

The above event types are described in Sections 2.1 through 2.2. General monitoring considerations are described in Section 2.3. Details of the groundwater monitoring are described in Table 1 and Figures 2 and 3.

### **2.1 Annual Groundwater Monitoring**

All (33) groundwater monitoring wells at the Site will be monitored during the annual groundwater monitoring event. If select wells cannot be accessed due to Site redevelopment activities, they will be scheduled for gauging and sampling during the semi-annual event. Water levels will be measured and groundwater samples will be collected and analyzed for VOCs by EPA Method 8260B.

Groundwater monitoring wells installed by Montrose and ILM will be sampled through coordination with their respective environmental contractors.

### **2.2 Semiannual Monitoring**

A semiannual monitoring event will be performed in September 2002. The routine groundwater monitoring program described in Section 2.3.2 will be performed at a reduced number (18) of groundwater monitoring wells as indicated in Table 1, focusing on the primary areas of groundwater impact. Depth to groundwater will be measured in all 33 of the groundwater monitoring wells. The wells that will be sampled in the reduced program were chosen to track the plume core and down-gradient conditions. Samples collected during the semiannual event will be tested for VOCs by EPA Method 8260B (Table 1).

### **2.3 Groundwater Monitoring Methodology**

#### **2.3.1 Health and Safety**

In accordance with the federal Occupational Safety and Health Act (OSHA), the work will be performed under a site-specific Health and Safety Plan that complies with OSHA standards for potentially hazardous field investigations (29CFR 1910.120). The existing Health and Safety Plan for groundwater monitoring at the BRC Former C-6 Facility will be used (Haley & Aldrich, Inc., 2001).

### **2.3.2 Fieldwork – Groundwater Monitoring and Sampling**

BRC will notify the Los Angeles Regional Water Quality Control board (LARWQCB) a minimum of one week prior to the start of groundwater monitoring events. The following activities will be performed:

#### **1. Water Level Gauging**

Prior to sampling each monitoring well, depth to groundwater will be measured in each well to the nearest one-hundredth of a foot using an electronic water level sounder. Data from the well gauging will be recorded in the Well Gauging Data Sheet (Appendix A) as well as the Boeing Data Management Plan (DMP) electronic form for upload to the project database (Appendix B). Monitoring well vapor concentration measurements will be recorded with a photo-ionization detector (PID) following the removal of the well cap and also recorded on the Well Gauging Data Sheet. All groundwater monitoring wells will be gauged within a single 24-hour period.

#### **2. Well Purging and Sampling**

Groundwater monitoring wells will be sampled spatially from low historic concentration locations to high historic concentration locations. Table 2 provides a recommended groundwater monitoring and well sampling order based on the January and July, 2001 groundwater monitoring data. Following well gauging, each well will be purged by extracting a minimum of three wetted well casing volumes of standing water with a pump. Purged water will be periodically monitored for temperature, pH, and specific conductance and recorded on the Groundwater Sampling Data Sheet (Appendix A). Purging will be completed when five well volumes have been removed, or when three consecutive measurements of specific conductance, pH, and temperature give values within 10% of each other.

Dissolved oxygen (DO) and oxidation reduction potential (ORP) parameters will also be measured in select wells per Table 2. These parameters will be collected and recorded in accordance with the Standard Operating Procedures for Measuring Natural Attenuation Parameters (England Geosystem and Haley & Aldrich, 2001).

After well purging parameters have stabilized, groundwater samples will be collected from the pump discharge in appropriate containers. Samples will be stored on ice in a cooler and transported by courier to a California-certified analytical laboratory for analysis under proper chain-of-custody. Chain-of-custody forms will be maintained throughout sample collection and transport. An example of the chain-of-custody form is provided in Appendix A. The

appropriate chain-of-custody information will also be electronically uploaded to the project database.

All equipment used for well purging and sampling will be cleaned between groundwater monitoring wells with an Alconox solution (or equivalent) and then double rinsed with tap water and deionized or distilled water to reduce the potential for cross-contamination. Well purge water and water used to decontaminate equipment will be stored in DOT 55-gallon drums, properly labeled, and stored on site at a location selected by BRC. The drums will be properly manifested and disposed of by BRC following receipt of laboratory results.

Groundwater analytical results will be reported in units of milligrams per liter (mg/L) or micrograms per liter ( $\mu\text{g}/\text{L}$ ) on RWQCB Laboratory Report Forms 10A/10B or their equivalent. Field data will be collected and recorded on standard groundwater monitoring forms in accordance with the Boeing Electronic DMP (Boeing EDMS, 2001).

The laboratory reports will be submitted electronically to the Project Data Management Company (PDMC).

### **2.3.3 Quality Assurance/Quality Control**

#### **1. Duplicate Samples**

One duplicate groundwater sample will be collected for every 20 groundwater samples (two in March and one in September). Sample duplicates are a check for sampling and analytical precision. During the annual sampling event, the duplicates will be analyzed for VOCs, Title 22 Metals, and hexavalent chromium. During the semiannual event, duplicates will be tested for VOCs only. Duplicates will be collected, numbered, packaged, and sealed in the same manner as the other samples. Duplicates will be assigned separate sample numbers and submitted blind to the laboratory.

#### **2. Rinsate Blanks**

One equipment rinsate blank sample will be collected prior to initiation of sampling and one each day (seven in March and four in September). Equipment rinse blank samples are a check for cross-contamination during sample collection. An equipment blank will be collected when sampling equipment is cleaned and re-used in the field. Appropriate water will be used to fill or rinse the sampling equipment after the equipment has been cleaned, and then collected in the sample containers. During the annual sampling event, the equipment rinsate blank will be analyzed for VOCs, Title 22 Metals, and hexavalent chromium. During the semiannual event, the equipment rinsate blank will be tested for VOCs only.

### 3. Travel Blanks

One travel blank will be prepared in the laboratory for each day that groundwater samples are collected and shipped to the laboratory. The travel blanks will be prepared in a clean environment and kept in the cooler used to ship samples. The travel blank provides a check for cross-contamination during transport, and will be analyzed for VOCs.

#### 2.3.4 Future Groundwater Monitoring Wells

The Site redevelopment plan is pending and currently unknown. Some existing groundwater monitoring wells may be decommissioned and groundwater monitoring wells may be replaced or added. An addendum to this groundwater monitoring plan will be issued for any changes to this proposed groundwater monitoring program.

### **3.0 GROUNDWATER MONITORING REPORT**

BRC will prepare and submit groundwater monitoring reports similar to those submitted to date that, as a minimum, contain:

- A groundwater elevation contour map;
- Tables and figures that depict the results of water quality testing;
- Groundwater sampling forms, field notes documenting field testing;
- Laboratory reports and chain of custody documentation;
- Appropriate descriptions of the sampling event, test results, and discussion and conclusions regarding water quality and hydrogeologic changes at the Site;
- Discussion of changes in Site/well conditions that might affect future sampling events; and
- Recommendations for modifications to the sampling program, if any.

Reports will be submitted to LARWQCB approximately 60 days after the completion of each sampling event. The report will consist of a hard copy of text, tables, figures, and analytical data. An electronic version of the report on compact disc will also be provided.

## **REFERENCES**

1. Haley & Aldrich, Inc./England Geosystem, 2001, Groundwater Monitoring Report, Annual Event, January/February 2001, Boeing Realty Corporation, Former C-6 Facility, Los Angeles, California, Prepared for Boeing Realty Corporation, Long Beach, California, dated June 20, 2001.
2. Kennedy/Jenks Consultants, Inc., 2000a, Groundwater Status Reported, dated October 27, 2000.
3. Poland, J.K., Garnett, A.A., and Sinnott, A., 1959, Geology, Hydrology and Chemical Characteristics of the Ground Waters in the Torrance-Santa Monica Area, California; USGS Water Supply Paper 1461.
4. State of California, Department of Water Resources, 1961, Planned Utilization of the Ground Water Basins of the Coastal Plain of Los Angeles County, Appendix A Ground Water Geology.
5. Kennedy/Jenks Consultants, Inc., 2000b, Groundwater Monitoring Work Plan 2000, dated December 15, 2000.
6. Haley & Aldrich, Inc., 2001, Site-Specific Health & Safety Plan for Boeing Realty Corporation Former C-6 Facility, 19503 South Normandie Avenue, dated June 8, 2001.
7. England Geosystem and Haley & Aldrich, 2001, Standard Operating Procedures for Measuring Natural Attenuation Parameters at Boeing Realty Corporation Former C-6 Facility. Revision 1.0, January 9, 2001.
8. Boeing Electronic Data Management System (Boeing EDMS), published February 2, 2001, Data Management Plan, Revision 3, August 2000.

Tables

## **TABLES**

**1 -E 1**  
**BEOING REALTY CORPORATION - FORMER C-6 FACILITY**  
**2002 GROUNDWATER MONITORING PROGRAM**  
**WELL COMPLETION INFORMATION**

Name	Easting <sup>1</sup>	Northing <sup>1</sup>	Top of Casing Elevation (AMSL) <sup>2,3</sup>	Boring Total Depth (feet)	Screen Depth Interval (feet)	Depth to top of Filter Pack (feet)	Casing Diameter (in)	Casing Type	Slot Size	Drilled Date
WCC-3S	12602.52	13238.90	51.16	92	69-89	64	4	Sched 40 PVC	0.010-Inch	10/26/1987
WCC-3D	12583.61	13265.87	51.16	140	120-140	115	4	Sched 40 PVC	0.010-Inch	6/27/1989
WCC-4S	12741.35	13075.30	49.65	91.5	70-590.5	65	4	Sched 40 PVC	0.010-Inch	10/27/1987
WCC-5S	12963.90	12998.70	48.84	91	61-91	63.5	4	Sched 40 PVC	0.010-Inch	11/24/1987
WCC-6S	12580.24	12953.10	51.32	91	60-90	54	4	Sched 40 PVC	0.010-Inch	9/22/1989
WCC-7S	12730.37	12868.65	50.23	90.5	60-90	54	4	Sched 40 PVC	0.010-Inch	6/8/1989
WCC-8S	12928.87	12627.94	46.93	91.5	60-90	55	4	Sched 40 PVC	0.010-Inch	9/21/1989
WCC-10S	113358.9	14038.98	58.17	90.8	60-90	54	4	Sched 40 PVC	0.010-Inch	6/7/1989
WCC-11S	12744.01	13870.68	51.37	91	60-90	56	4	Sched 40 PVC	0.010-Inch	9/13/1990
WCC-12S	12749.26	12715.21	46.93	91.5	60-90	55	4	Sched 40 PVC	0.010-Inch	9/17/1990
DAC-PI	11194.86	12988.63	-	90	60-90	55	4	Sched 40 PVC	0.010-Inch	9/25/1989
TMW-1	12212.00	13143.49	51.24	86	61-81	59	2	Sched 40 PVC	0.010-Inch	6/28/1998
TMW-2	12478.09	13161.38	51.18	87	62-82	57	2	Sched 40 PVC	0.010-Inch	6/28/1998
TMW-3	11909.54	12315.47	51.07	87	62.5-82.5	60	2	Sched 40 PVC	0.010-Inch	7/21/1998
TMW-4	12498.69	12334.70	50.35	86	60-80	58	2	Sched 40 PVC	0.010-Inch	6/30/1998
TMW-5	12038.44	11931.45	50.12	86	61.3-81.3	58.9	2	Sched 40 PVC	0.010-Inch	7/2/1998
TMW-6	12552.93	11936.32	50.13	86	61.2-81.2	59.1	2	Sched 40 PVC	0.010-Inch	7/1/1998
TMW-7	12560.70	12701.25	51.12	89.5	64-84	62	2	Sched 40 PVC	0.010-Inch	6/29/1998
TMW-8	12571.93	12812.42	51.06	89.5	61-81	59	2	Sched 40 PVC	0.010-Inch	6/30/1998
TMW-9	12344.53	12740.05	51.21	86	61-81	59	2	Sched 40 PVC	0.010-Inch	1/28/1999
TMW-10	12968.14	12170.61	47.52	85	60.5-80.5	57.6	2	Sched 40 PVC	0.010-Inch	2/1/1999
TMW-11	12968.08	11423.04	47.47	83	58-78	5406	2	Sched 40 PVC	0.010-Inch	6/29/1998
TMW-12	12529.43	11402.90	50.85	88	62-82	59.3	2	Sched 40 PVC	0.010-Inch	1/27/1999
TMW-13	11973.10	11416.11	50.91	85	60-80	58	2	Sched 40 PVC	0.010-Inch	2/2/1999
TMW-14	11797.06	11416.11	58.21	90	63-85	63	2	Sched 40 PVC	0.010-Inch	2/3/1999
TMW-15	11800.22	12165.10	55.26	92	62-87	60	2	Sched 40 PVC	0.010-Inch	2/4/1999
TMW-16	11887.57	12904.74	50.91	82.5	56.5-76.5	54.5	2	Sched 40 PVC	0.010-Inch	1/29/1999
TMW-17	11533.67	12604.45	-	87	62-82	59	2	Sched 40 PVC	0.010-Inch	5/10/1999
BL-1	11218.52	13450.56	58.34	81.5	61.5-81.5	56.5	2	Sched 40 PVC	0.010-Inch	2/2/1999
BL-3	11207.79	11961.46	59.33	82	62-82	59	2	Sched 40 PVC	0.010-Inch	2/8/1999
<b>Montrose Wells</b>										
XMW-09	12654.63	11148.11	-	-	66-81	-	4	-	-	5/9/1989
XMW-18	12286.92	11426.42	-	-	68-83	-	4	-	-	3/29/1990
XMW-19	12968.08	11757.92	-	-	63-79	-	4	-	-	3/30/1990

- local coordinate system (feet)
- AMSL- Above Mean Sea Level
- Casing elevations will be re-surveyed prior to the March 2002 annual event.

**TABLE 2**  
**BOEING REALTY CORPORATION - FORMER C-6 FACILITY**  
**2002 GROUNDWATER MONITORING PROGRAM**  
**ANALYTICAL PROGRAM**

Name	Sampling Order	Analytical Program March 2002		Analytical Program September 2002	
		VOCs (8260B)	DO and ORP	VOCs (8260B)	DO and ORP
WCC-3S	19	✓			
WCC-3D	6	✓			
WCC-4S	24	✓			
WCC-5S	3	✓			
WCC-6S	28	✓			
WCC-7S	18	✓			
WCC-9S	14	✓			
WCC-10S	16	✓			
WCC-11S	12	✓			
WCC-12S	17	✓			
DAC-P1	32	✓			
TMW-1	21	✓			
TMW-2	33	✓			
TMW-3	31	✓			
TMW-4	26	✓			
TMW-5	30	✓			
TMW-6	15	✓			
TMW-7	27	✓			
TMW-8	29	✓			
TMW-9	23	✓			
TMW-10	5	✓			
TMW-11	8	✓			
TMW-12	20	✓			
TMW-13	13	✓			
TMW-14	7	✓			
TMW-15	10	✓			
TMW-16	4	✓			
TMW-17	11	✓			
BL-1	2	✓			
BL-3	22	✓			
XMW-09	1	✓			
XMW-18	25	✓			
XMW-19	9	✓			
<b>Quality Control Samples</b>					
Duplicates (1 per wells)		✓ (est. 2)		✓ (est. 1)	
Rinsate Blanks (1 per day)		✓ (est. 7)		✓ (est. 4)	
Field Blanks (1 per day)		✓ (est. 6)		✓ (est. 3)	
Travel Blanks (1 per day)		✓ (est. 6)		✓ (est. 3)	

**Notes:**

est = Quality control sample number estimated based on estimated number of sampling days

DO = Dissolved Oxygen (Field Analysis)

ORP = Oxidation Reduction Potential (Field Analysis)

Figures

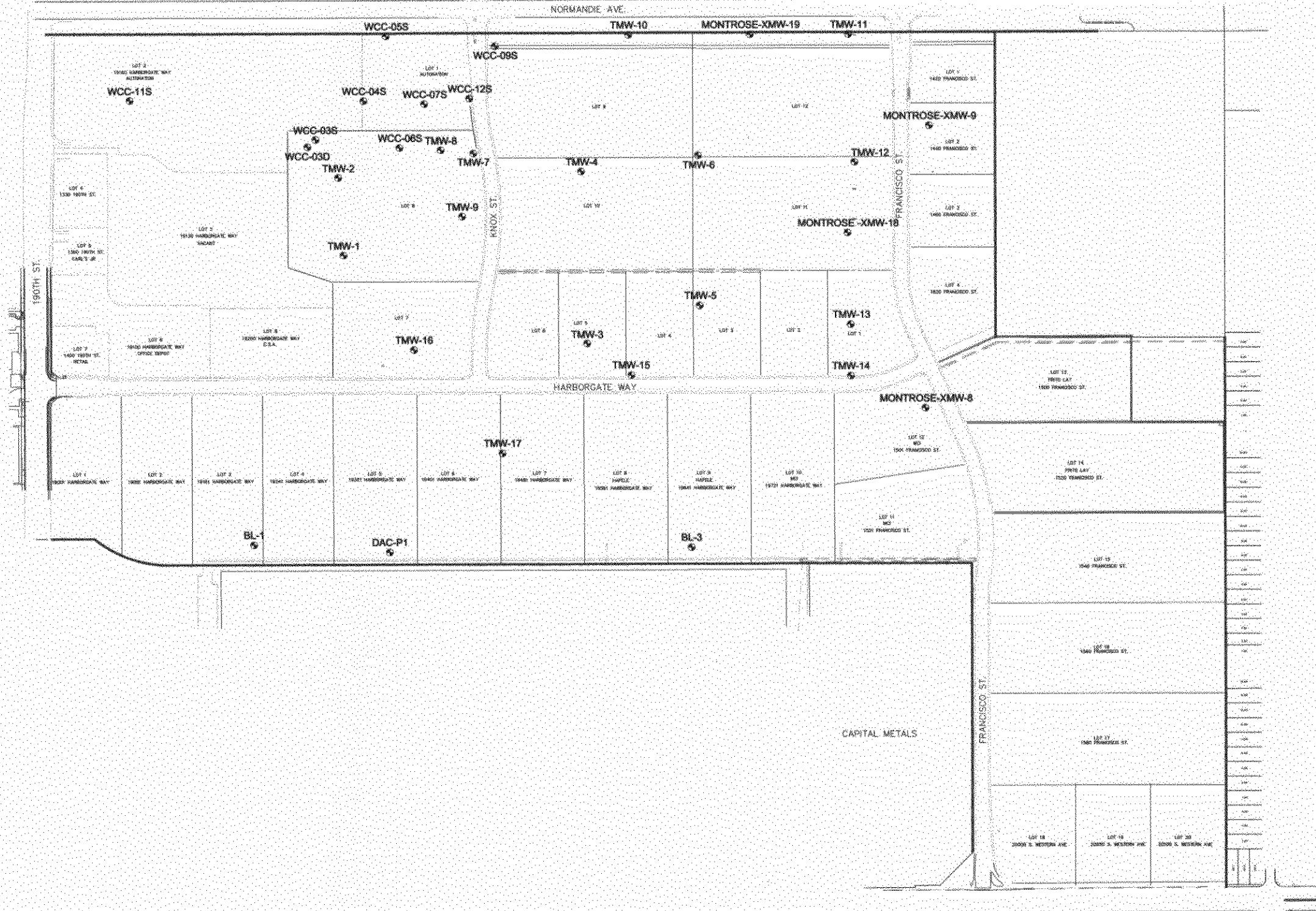
## **FIGURES**



**Figure 1**  
**Site Location Map**

Boeing Reality Corporation  
Former C-6 Facility  
Los Angeles, California

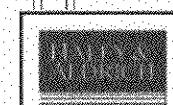
HOLLY & ALDRICH	UNDERGROUND ENGINEERING & ENVIRONMENTAL SOLUTIONS
Scale : As Shown	QA/QC :
Drawn : DPM	Reviewed : SP2 Date : 20 December 2001



#### LEGEND

- TMW-1: GROUNDWATER MONITORING WELL TO BE SAMPLED ANNUALLY
- PARCEL BOUNDARY
- BUILDING FOOTPRINTS (PROPOSED)

0 100 200 400  
FEET



BOEING REALTY CORPORATION  
FORMER C-6 FACILITY  
LOS ANGELES, CALIFORNIA

UNDERGROUND  
ENGINEERING &  
ENVIRONMENTAL  
SOLUTIONS

SCALE: AS SHOWN | PROJECT: 27608  
DRAWN: SAL | REVIEWED: RMF | DATE: 20 DEC. 2001

FIGURE: 2

GROUNDWATER MONITORING WELLS  
2002 ANNUAL SAMPLING EVENT



Appendix A

**APPENDIX A**  
**FIELD FORMS**

Well Gauge Data Sheet

**Site Name:**

Groundwater Sampling Data Sheet

Page \_\_\_\_\_ of \_\_\_\_\_

ft-bmp = feet below measuring point  
LNAPL = light non-aqueous phase liquid  
G:\Projects\ENVIRONMENTAL\Boeing

**Chain of  
Custody Record**

**SEVERN  
TRENT  
SERVICES**

**Severn Trent Laboratories, Inc.**

STL-4124 (0700)

**DISTRIBUTION:** *WHITE* - Stays with the Sample; *CANARY* - Returned to Client with Report; *PINK* - Field Copy

Appendix B

**APPENDIX B**  
**DATA MANAGEMENT FORMS**

3-1 Document Identification

3-3 Objects

Task ID	Task Name	Start Date	End Date	Duration	Due Date	Total Work	Total Effort	Total Risk	Manager	Category	Priority	Owner	Notes
TASK-001	Project A Phase 1	2023-01-01	2023-03-31	90 days	2023-03-31	1000 hours	500 hours	Medium	Manager A	Development	High	Team Lead A	Initial planning and requirements gathering.
TASK-002	Feature B Development	2023-02-01	2023-04-30	80 days	2023-04-30	1200 hours	600 hours	Medium	Manager B	Development	Medium	Team Lead B	Implementation of new feature B.
TASK-003	System C Integration	2023-03-01	2023-05-31	80 days	2023-05-31	800 hours	400 hours	Medium	Manager C	Development	Medium	Team Lead C	Integration of System C.
TOTAL-001	Grand Total	2023-01-01	2023-05-31	150 days	2023-05-31	3000 hours	1500 hours	Medium	Overall Manager	Overall	Medium	N/A	Summary of all tasks.

## 3-5 Sample Log

Text(4) Table B-25	Text(4) Table B-24	Text(6)	Text(21)	Text(2) Table B-10	Decimal(5,2) Text(4)	Decimal(5,2) Text(4)	Text(4) Feet	Text(4) Feet	Text(50) Table B-11	Date/Time	Text(50)	Text(2)	Text(2) Table B-19
Project ID	Mandatory	Mandatory	Mandatory	Mandatory	Mandatory	Mandatory	Mandatory	Mandatory	Mandatory	Mandatory	Mandatory	Mandatory	Sample Type
C1, C6, etc.			See Table 3-6 and Figure 3-4	SO, WG, AV, WD etc.									PS, EB, TB, etc.

Unique identifier of object. From Site object table.

Object Name

Sample Name

Matrix Type

Top Depth

Base Depth

Depth Units

Monitoring Frequency

Collection Date

Sampling Event

Required if GW sampling.

Well vapor, use depth to bottom of screen interval.  
<= Base depth, Feet.  
>= Top depth, Feet.

If groundwater sample or SVE well vapor sample, use depth to top of screen interval.  
<= Base depth, Feet.  
>= Top depth, Feet.

Well Vapour, use depth to bottom of screen interval.  
<= Top depth, Feet.

Required if GW sampling.

For each event or sample site, contractor, investigation.

Name of collected from Object. Name of site, contractor, investigation.

3-5 Sample Log

SCO/DateTemplate/01256006 - 3-5 Sample Log

3-5 Sample Log

3-5 Sample Log

Text(12)	Integer	Text(12)	Table B-3		
Table B-3					

### 3-7 Field Monitoring Data

## 3-8 Soil Cores

Text(4)	Text(4)	Text(6)	Date/Time	Decimal(5,2)	Decimal(5,2)	Text(50)	Text(4)	Integer	Text(4)	Text(50)	Text(11)	Text(50)
Table B-30	Table B-29					Table B-23	Text(4)	Integer	Text(4)	Text(50)	Table B-6	Table B-6
Mandatory	Mandatory	Mandatory	Mandatory	Mandatory	Mandatory	Mandatory	Conditional	Conditional	Conditional	Conditional	Mandatory	Optional
Project ID	Consultant ID	Object Name	Date_This_Collected	Top Depth	Base Depth	Depth Units	Sampling Device	Blow Count	Distance Units	Avgmt Recovery	Lithology Description	Condition
C1, C6, etc.	C1, C6, etc.	C1, C6, etc.	08/01/2001 13:45 - (use 24 hour clock)	Bottom depth of soil core. Feet	Top depth of soil core. Feet	Blow count of soil core. Feet	Note: Use "Feet" - do not shorten or change Note: Use "Feet" - do not shorten or change	Blow counts for the distance.	Blow Count	Distance Units	Comments	Comments
				Bottom depth of soil core. Feet	Top depth of soil core. Feet	Blow count of soil core. Feet						

3-9 Linology

3-10 Core Headspace

3-11 Borehole Geophysics

## 3-11 Borehole Geophysics

Text(21)	Text(50) Table B-20	Decimal(5,2)	Text(4) Feet	Text(30) Table B-30	Decimal(5,2)	Text(10) Table B-30	Text(30) Table B-30	Decimal(5,2)	Text(10) Table B-30
See Table 3-6 and Figure 3-4									
Conditional	Conditional	Conditional	Text Feet	Text Example: Pore Pressure	Measured Value	Example: psi	Measured Units,		
Sample Name	Sampling Device	Piezometer	Text Reading	Geophysics Parameter Type 1	Geophysics Measure 1	Geophysics Measure 1	Geophysics Units 1	Geophysics Parameter Type 2	Geophysics Measure 2
		Piezometer	Units						

3-11 Borehole Geophysics

## 3-11 Borehole Geophysics

Text(50)
Text(50)
Optional Comments

3-12 Well Construction

## 3-12 Well Construction

Conditional	Seal Diameter Unit	Seal Diameter	Seal Top Depth	Seal Base Depth	Seal Depth Unit	Seal Gradation	Seal Material City	Seal Qty Unit	Screen Type	Conditional	Conditional	Required for each casing Interval. Feet.	Required for each casing Interval. Inches.	Required for each casing Interval. Inches.	Required for each casing Interval. Feet.	Required for each casing Interval. Cubic Feet.	Required for each casing Interval.	Required for each screen Interval.	Text(30)	Text(10)	Text(30)	Table B-21
Decimal(5,2)	Text(6) Inches	Decimal(5,2)	Decimal(5,2)	Text(4) Feet		Text(30)				Conditional	Conditional	Required for each casing Interval. Feet.	Required for each casing Interval. Cubic Feet.	Required for each casing Interval.	Required for each casing Interval.	Required for each casing Interval.	Required for each screen Interval.	Required for each screen Interval.	Text(30)	Text(10)	Cubic Feet	

## 3-12 Well Construction

Decimal(5,2) Inches	Text(6) Inches	Decimal(5,2)	Decimal(5,2)	Text(4) Feet	Decimal(5,2)	Text(6) Inches	Text(30) Table B-8	Text(6) Decimal(5,2)	Text(6) Decimal(5,2)
Conditional Screen Diameter	Conditional Screen Diameter	Conditional Screen Top Depth	Conditional Screen Base Depth	Conditional Screen Depth Unit	Conditional Screen Slot Size	Conditional Screen Slot Size	Filterpack Type	Filterpack Diameter	Filterpack Diameter Unit
Required for each screen Interval.									
Required for each screen Interval. Inches.									
Conditional Interval. Inches									

## 3-12 Well Construction

Conditional	Filterpack Depth Unit	Filterpack Gradation	Material Qty	Filterpack Qty	Outside Seal Unit	Water Depth Units	Water Depth Units	Comments
Conditional	Conditional	Conditional	Conditional	Mandatory	Mandatory	Mandatory	Mandatory	Optional
Required for each screen Interval. Feet.	Required for each screen Interval. Cubic Feet.	Required for each screen Interval. Cubic Feet.	Required for each screen Interval. Cubic Feet.	Yes or No.	Report in Feet	Feet	Text(4)	Text(50)
Required for each screen Interval.	Required for each screen Interval.	Required for each screen Interval.	Required for each screen Interval.	Cubic Feet	Boolean(3)	Decimal(5,2)	Text(10)	Text(20)
Required for each screen Interval. Feet.	Required for each screen Interval. Cubic Feet.	Required for each screen Interval. Cubic Feet.	Required for each screen Interval. Cubic Feet.	Yes or No.	Yes or No	Yes or No	Text(4)	Text(50)



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